

IN THE CLAIMS:

Please substitute the following claims for the same-numbered claims in the application.

1. (Currently Amended) A scanning probe microscope tip coated with a layer of chemically-synthesized nanoparticles ~~permanently adhered~~ affixed to said tip, each of said nanoparticles comprising a length and width, wherein said length differs from said width by less than approximately 15%,

wherein said each of said nanoparticles comprises an outer coating layer encapsulating each nanoparticle[[.]],

wherein said tip is coated with an adhesion layer,

wherein said adhesion layer is between said tip and said nanoparticles, and

wherein said nanoparticles are generally spherical.

2. (Original) The tip of claim 1, wherein said scanning probe microscope tip is one of an atomic force microscope tip, a near-field scanning optical microscope tip, and a scanning tunneling microscope tip.

3. (Original) The tip of claim 1, wherein said nanoparticles comprise at least one of an amorphous, crystalline, ferromagnetic, paramagnetic, superparamagnetic, antiferromagnetic, ferrimagnetic, magneto optic, ferroelectric, piezoelectric, superconducting, semiconducting, magnetically-doped semiconducting, insulating, fluorescent, and chemically catalytic nanoparticles.

10/039,635

2

4. (Previously Presented) The tip of claim 1, wherein said outer coating layer comprises an organic layer; wherein said nanoparticles having a diameter ranging from 2 nm to 20 nm, and said organic layer having a thickness ranging from 0.5 nm to 5 nm.

5. (Previously Presented) The tip of claim 1, wherein said outer coating layer comprises an organic coat comprising a head-group and a tail-group;

wherein said head group comprises one of an amine, carboxylic acid, isocyanide, nitrile, phosphene, phosphonic acid, sulfonic acid, thiol, and trichlorosilane; and

wherein said tail-group comprises one of an alkyl chain, aryl chain, fluorocarbon, siloxane, fluorophore, DNA, carbohydrate, and protein.

6. (Currently Amended) The tip of claim 1, wherein said ~~tip is coated with an~~ adhesion layer ~~comprising of~~ comprises one of n-(2-aminoethyl) 3-aminopropyl-trimethoxysilane, polyethylincimine, polymethylmethacrylate, epoxy, cyanoacrylate adhesive, and an α,ω alkyl chain.

7. (Original) The tip of claim 1, wherein said layer of chemically-synthesized nanoparticles is at least one nanoparticle thick.

8. (Original) The tip of claim 1, wherein said layer of chemically-synthesized nanoparticles is a single layer of nanoparticles thick and covers only the apex of said tip.

9. (Original) The tip of claim 1, wherein said layer of chemically-synthesized nanoparticles comprises a single nanoparticle affixed to an apex of said tip.

10. (Currently Amended) A method of forming a scanning probe microscope tip, said method comprising:

coating said scanning probe microscope tip with an adhesion promoter;

dipping said scanning probe microscope tip into a liquid solution of nanoparticles, each of said nanoparticles comprising a length and a width; and

withdrawing said scanning probe microscope tip from said solution;

said length differs from said width by less than approximately 15%;

wherein said step of dipping causes said nanoparticles to permanently adhere affixed to said scanning probe microscope tip,

wherein said scanning probe microscope tip comprises a tip apex, and

wherein said each of said nanoparticles comprises an outer coating layer~~[[.]]~~, and

wherein said nanoparticles are generally spherical.

11. (Original) The method of claim 10, wherein said step of dipping said scanning probe microscope tip into a solution of nanoparticles comprises dipping said scanning probe microscope tip into a monolayer of nanoparticles floating on a liquid subphase.

12. (Original) The method of claim 10, wherein said step of dipping said scanning probe

microscope tip into a solution of nanoparticles comprises inking an elastomer with a plurality of nanoparticles; and dipping said scanning probe microscope tip into said elastomer.

13. (Original) The method of claim 10, further comprising washing off said solution after said step of withdrawing said scanning probe microscope tip from said solution, wherein said solution is a nonvolatile solution.

14. (Original) The method of claim 10, further comprising applying an electric potential to said scanning probe microscope tip prior to said step of dipping said scanning probe microscope tip into a solution of nanoparticles.

15. (Original) The method of claim 14, wherein said solution further comprises an electrochemical solution, a supporting electrolyte, and an electrode held at a neutral potential.

16. (Original) The method of claim 10, wherein said nanoparticles form a layer around said scanning probe microscope tip, wherein said layer is one nanoparticle thick.

17. (Previously Presented) The method of claim 10, wherein said nanoparticles form a layer around said scanning probe microscope tip, wherein said layer comprises a single layer of nanoparticles and covers only said tip apex.

18. (Original) The method of claim 10, wherein only a single nanoparticle is affixed to said

tip apex.

19. (Canceled).

20. (Original) The method of claim 10, wherein said step of dipping said scanning probe microscope tip into a solution of nanoparticles comprises submerging said tip into said liquid solution.

21. (Original) The method of claim 10, wherein said nanoparticles form a layer around said tip, said method further comprising exposing said layer of nanoparticles to one of a laser light, a beam of electrons, ultraviolet light, and heat.

22. (Original) The method of claim 10, wherein said nanoparticles form a layer around said tip, said method further comprising transforming said layer of nanoparticles into an electrically continuous film by annealing.

23. (Original) The method of claim 10, wherein said nanoparticles form a layer around said tip, said method further comprising orienting uniformly the magnetic axis of said nanoparticles by annealing in the presence of a magnetic field.

24. (Currently Amended) A method of forming a scanning probe microscope tip, said method comprising:

10/039,635

6

coating said scanning probe microscope tip, with the exception of an apex of said tip,
with a sacrificial adhesion layer;

depositing generally spherical nanoparticles over said tip, wherein said nanoparticles are
~~permanently adhered~~ affixed to said tip, each of said nanoparticles comprising a length and
width, said length differs from said width by less than approximately 15%; and

removing said sacrificial layer,

wherein said each of said nanoparticles comprises an outer coating layer encapsulating
each nanoparticle.

25. (Currently Amended) A method of forming a scanning probe microscope tip, said method
comprising:

coating said scanning probe microscope tip with an adhesion promoter;

dipping said scanning probe microscope tip into a monolayer of generally spherical
nanoparticles floating on a liquid subphase, each of said nanoparticles comprising a length and
width, said length differs from said width by less than approximately 15%; and

withdrawing said scanning probe microscope tip from said liquid subphase;

wherein said step of dipping causes said nanoparticles to ~~permanently adhere~~ affix to said
scanning probe microscope tip,

wherein said scanning probe microscope tip comprises a tip apex, and

wherein said each of said nanoparticles comprises an outer coating layer encapsulating
each nanoparticle.

26. (Currently Amended) A method of forming a scanning probe microscope tip, said method comprising:

inking an elastomer with a plurality of generally spherical nanoparticles, each of said nanoparticles comprising a length and width, said length differs from said width by less than approximately 15%;

coating said scanning probe microscope tip with an adhesion promoter;

dipping said scanning probe microscope tip into said elastomer; and

withdrawing said scanning probe microscope tip from said elastomer;

wherein said step of dipping causes said nanoparticles to ~~permanently adhere~~ affix to said scanning probe microscope tip,

wherein said scanning probe microscope tip comprises a tip apex, and

wherein said each of said nanoparticles comprises an outer coating layer encapsulating each nanoparticle.

27. (Currently Amended) A method of forming a scanning probe microscope tip, said method comprising:

coating said scanning probe microscope tip with an adhesion promoter;

dipping said scanning probe microscope tip into a liquid solution, wherein said liquid solution is nonvolatile and further comprises a plurality of generally spherical nanoparticles dispersed therein, each of said nanoparticles comprising a length and width, said length differs from said width by less than approximately 15%;

withdrawing said scanning probe microscope tip from said liquid solution; and

10/039,635

8

each nanoparticle.

10/039,635

9

29. (Original) The method of claim 28, wherein said electrochemical solution further comprises a supporting electrolyte and a reference electrode.
30. (Canceled).
31. (Previously Presented) The tip of claim 1, wherein said nanoparticles comprise generally spherical cobalt nanoparticles.
32. (Previously Presented) The tip of claim 1, wherein said outer coating layer comprises a layer of oleic acid.
33. (Canceled).
34. (Canceled).
35. (Canceled).
36. (Canceled).
37. (Currently Amended) A scanning probe microscope tip coated with a layer of chemically-synthesized generally spherical nanoparticles ~~stuck~~ affixed to said tip, wherein said

nanoparticles are shaped in a configuration other than an elongated tube configuration, and wherein each of said nanoparticles comprises an outer coating layer encapsulating each nanoparticle[[]], wherein said scanning probe microscope tip is coated with an adhesion layer, and wherein said adhesion layer is between said tip and said nanoparticles.

38. (New) A scanning probe microscope tip coated with a layer of chemically-synthesized nanoparticles affixed to said tip, each of said nanoparticles comprising a length and width, wherein said length differs from said width by less than approximately 15%,

wherein said each of said nanoparticles comprises an outer coating layer encapsulating each nanoparticle,

wherein said outer coating layer comprises an organic layer,

wherein said nanoparticles having a diameter ranging from 2 nm to 20 nm, and said organic layer having a thickness ranging from 0.5 nm to 5 nm,

wherein said outer coating layer comprises an organic coat comprising a head-group and a tail-group;

wherein said head group comprises one of an amine, carboxylic acid, isocyanide, nitrile, phosphene, phosphonic acid, sulfonic acid, thiol, and trichlorosilane;

wherein said tail-group comprises one of an alkyl chain, aryl chain, fluorocarbon, siloxane, fluorophore, DNA, carbohydrate, and protein,

wherein said tip is coated with an adhesion layer,

wherein said adhesion layer is between said tip and said nanoparticles,

wherein said nanoparticles are generally spherical,

wherein said adhesion layer comprises one of n-(2-aminoethyl) 3-aminopropyl-trimethoxysilane, polyethylencimine, polymethylmethacrylate, epoxy, cyanoacrylate adhesive, and an α,ω alkyl chain,

wherein said layer of chemically-synthesized nanoparticles is a single layer of nanoparticles thick and covers only the apex of said tip, and

wherein said layer of chemically-synthesized nanoparticles is at least one nanoparticle thick.

39. (New) The tip of claim 38, wherein said scanning probe microscope tip is one of an atomic force microscope tip, a near-field scanning optical microscope tip, and a scanning tunneling microscope tip.

40. (New) The tip of claim 38, wherein said nanoparticles comprise at least one of an amorphous, crystalline, ferromagnetic, paramagnetic, superparamagnetic, antiferromagnetic, ferrimagnetic, magneto optic, ferroelectric, piezoelectric, superconducting, semiconducting, magnetically-doped semiconducting, insulating, fluorescent, and chemically catalytic nanoparticles.

41. (New) The tip of claim 38, wherein said layer of chemically-synthesized nanoparticles comprises a single nanoparticle affixed to an apex of said tip.

42. (New) A scanning probe microscope tip coated with a layer of chemically-synthesized

generally spherical nanoparticles affixed to said tip, each of said nanoparticles comprising a length and width, wherein said length differs from said width by less than approximately 15%,

wherein said each of said nanoparticles comprises an outer coating layer encapsulating each nanoparticle,

wherein said tip is coated with an adhesion layer,

wherein said adhesion layer is between said tip and said nanoparticles,

wherein said adhesion layer comprises one of n-(2-aminoethyl)

3-aminopropyl-trimethoxysilane, polyethyleneimine, polymethylmethacrylate, epoxy,

cyanoacrylate adhesive, and an α,ω alkyl chain, and

wherein said layer of chemically-synthesized nanoparticles is at least one nanoparticle thick.